CLAIMS.

What is claimed and desired to be secured by Letters Patent is as follows:

1. A circuit protection device for protecting an ~~HVAC~~ control circuit from overcurrents, said device comprising:

a ~~PTC~~ member, said PTC member configured for installation in an HVAC control circuit and adapted so:

a steady state trip current, I_{trip}, through said PTC member which will cause said PTC member to trip is less than a maximum current carrying capacity, I_{max}, of an HVAC control circuit to be protected and is greater than a combined load current, I_{load}, drawn by all loads in said HVAC control circuit to be protected during normal operation;

the resistance of said PTC member increases upon tripping to limit current in said HVAC control circuit to be protected to a steady state value substantially lower than I_{trip}, I_{load}, and I_{max};

said PTC member returns to a state allowing I_{load} to be conducted in said HVAC control circuit to be protected upon removal of conditions which caused said PTC member to trip; and

said PTC member has a voltage rating commensurate with other elements in the HVAC control circuit to be protected;

a pair of connective members configured so that said PTC member is disposed between and in electrical contact with said connective members, so that said connective members provide an external electrical interface for said circuit protection device; and

a protective member at least partially covering said PTC member and said connective members, said protective member adapted to insulate a user from contact with electrical hazard when said circuit protection device is installed in an HVAC control circuit to be protected thereby and to protect said circuit protection device from performance-affecting electrical and physical contact during use.

2. The invention as recited in Claim 1 wherein said connective members are configured as a pair of parallel coplanar blades electrically and mechanically compatible with a blade-type fuse receptacles of an HVAC control circuit.

3. The invention as recited in Claim 1 said wherein said connective members comprise a pair of insulated lead wires of sufficient length to allow a tradesman skilled in the art to splice said circuit protection device into an HVAC control circuit to be protected.

4. The invention as recited in Claim 1, wherein said connective members and said protective member are configured to be electrically and mechanically compatible with a screw-type fuse receptacle of an HVAC control circuit.

5. The invention as recited in Claim 1, wherein said connective members and said protective member are configured to be electrically and mechanically compatible with a cartridge-type fuse receptacle of an HVAC control circuit.

6. A method for protecting a heating, ventilation, and air conditioning (HVAC) control circuit from overcurrents comprising the steps of:

providing a circuit protection device for protecting an HVAC control circuit from overcurrents, said device comprising:

a ~~PTC~~ member, said PTC member configured for installation in an HVAC control circuit and adapted so:

a steady state trip current, I_{trip}, through said PTC member which will cause said PTC member to trip is less than a maximum current carrying capacity, I_{max}, of an HVAC control circuit to be protected and is greater than a combined load current, I_{load}, drawn by all loads in said HVAC control circuit to be protected during normal operation;

the resistance of said PTC member increases upon tripping to limit current in said HVAC control circuit to be protected to a steady state value substantially lower than I_{trip}, I_{load}, and I_{max};

said PTC member returns to a state allowing I_{load} to be conducted in said HVAC control circuit to be protected upon removal of conditions which caused said PTC member to trip; and

said PTC member has a voltage rating commensurate with other elements in the HVAC control circuit to be protected;

a pair of connective members configured so that said PTC member is disposed between and in electrical contact with said connective members, so that said connective members provide an external electrical interface for said circuit protection device, said connective members configured as a pair of parallel coplanar blades electrically and mechanically compatible with common blade-type fuse receptacles found in HVAC control circuits,

a protective member at least partially covering said PTC member and said connective members, said protective member adapted to insulate a user from contact with electrical hazard when said circuit protection device is installed in an HVAC control circuit to be protected thereby and to protect said circuit protection device from performance-affecting electrical and physical contact during use,

removing any existing overcurrent protection device from a blade-type fuse receptacle of said HVAC control circuit to be protected,

inserting the said circuit protection device into said blade-type fuse receptacle of said HVAC control circuit thereby protecting said HVAC control circuit from overcurrent conditions.

7. A method for protecting a heating, ventilation, and air conditioning (HVAC) control circuit from overcurrents comprising the steps of:

providing a circuit protection device for protecting an HVAC control circuit from overcurrents, said device comprising:

a PTC member, said PTC member configured for installation in an HVAC control circuit and adapted so:

a steady state trip current, I_{trip}, through said PTC member which will cause said PTC member to trip is less than a maximum current carrying capacity, I_{max}, of an HVAC control circuit to be protected and is greater than a combined load current, I_{load}, drawn by all loads in said HVAC control circuit to be protected during normal operation;

the resistance of said PTC member increases upon tripping to limit current in said HVAC control circuit to be protected to a steady state value substantially lower than I_{trip}, I_{load}, and I_{max};

said PTC member returns to a state allowing I_{load} to be conducted in said HVAC control circuit to be protected upon removal of conditions which caused said PTC member to trip; and

said PTC member has a voltage rating commensurate with other elements in the HVAC control circuit to be protected;

a pair of connective members configured so that said PTC member is disposed between and in electrical contact with said connective members, so that said connective members provide an external electrical interface for said circuit protection device, said connective members comprise a pair of insulated lead wires of sufficient length to allow a tradesman skilled in the art to splice said circuit protection device into an HVAC control circuit to be protected,

a protective member at least partially covering said PTC member and said connective members, said protective member adapted to insulate a user from contact with electrical hazard when said circuit protection device is installed in an HVAC control circuit to be protected thereby and to protect said circuit protection device from performance-affecting electrical and physical contact during use,

splicing said circuit protection device into a circuit to be protected, said circuit protection device spliced in series with an electrical power source of the circuit to be protected and an impedance representative of the cumulative load of the circuit to be protected.

8. A method for protecting a heating, ventilation, and air conditioning (HVAC) control circuit from overcurrents comprising the steps of:

providing a circuit protection device for protecting an HVAC control circuit from overcurrents, said device comprising:

a ~~PTC~~ member, said PTC member configured for installation in an HVAC control circuit and adapted so:

a steady state trip current, I_{trip}, through said PTC member which will cause said PTC member to trip is less than a maximum current carrying capacity, I_{max}, of an HVAC control circuit to be protected and is greater than a combined load current, I_{load}, drawn by all loads in said HVAC control circuit to be protected during normal operation;

the resistance of said PTC member increases upon tripping to limit current in said HVAC control circuit to be protected to a steady state value substantially lower than I_{trip}, I_{load}, and I_{max};

said PTC member returns to a state allowing I_{load} to be conducted in said HVAC control circuit to be protected upon removal of conditions which caused said PTC member to trip; and

said PTC member has a voltage rating commensurate with other elements in the HVAC control circuit to be protected;

a pair of connective members configured so that said PTC member is disposed between and in electrical contact with said connective members, so that said connective members provide an external electrical interface for said circuit protection device,

a protective member at least partially covering said PTC member and said connective members, said protective member adapted to insulate a user from contact with electrical hazard when said circuit protection device is installed in an HVAC control circuit to be protected thereby and to protect said circuit protection device from performance-affecting electrical and physical contact during use,

said connective members and said protective member are configured electrically and mechanically compatible with common screw-type fuse receptacles found in HVAC control circuits,

removing any existing overcurrent protection device from a screw-type fuse receptacle of said HVAC control circuit to be protected,

screwing the said circuit protection device into the screw-type fuse receptacle of said HVAC control circuit thereby protecting said HVAC control circuit from overcurrent conditions.

9. A method for protecting a heating, ventilation, and air conditioning (HVAC) control circuit from overcurrents comprising the steps of:

providing a circuit protection device for protecting an HVAC control circuit from overcurrents, said device comprising:

a ~~PTC~~ member, said PTC member configured for installation in an HVAC control circuit and adapted so:

a steady state trip current, I_{trip}, through said PTC member which will cause said PTC member to trip is less than a maximum current carrying capacity, I_{max}, of an HVAC control circuit to be protected and is greater than a combined load current, I_{load}, drawn by all loads in said HVAC control circuit to be protected during normal operation;

the resistance of said PTC member increases upon tripping to limit current in said HVAC control circuit to be protected to a steady state value substantially lower than I_{trip}, I_{load}, and I_{max};

said PTC member returns to a state allowing I_{load} to be conducted in said HVAC control circuit to be protected upon removal of conditions which caused said PTC member to trip; and

said PTC member has a voltage rating commensurate with other elements in the HVAC control circuit to be protected;

a pair of connective members configured so that said PTC member is disposed between and in electrical contact with said connective members, so that said connective members provide an external electrical interface for said circuit protection device,

a protective member at least partially covering said PTC member and said connective members, said protective member adapted to insulate a user from contact with electrical hazard when said circuit protection device is installed in an HVAC control circuit to be protected thereby and to protect said circuit protection device from performance-affecting electrical and physical contact during use,

said connective members and said protective member are configured to be electrically and mechanically compatible with a cartridge-type fuse receptacles of said HVAC control circuit to be protected,

removing any existing overcurrent protection device from a cartridge-type fuse receptacle of said HVAC control circuit to be protected,

inserting said circuit protection device into said cartridge-type fuse receptacle of said HVAC control circuit thereby protecting said HVAC control circuit from overcurrent conditions.